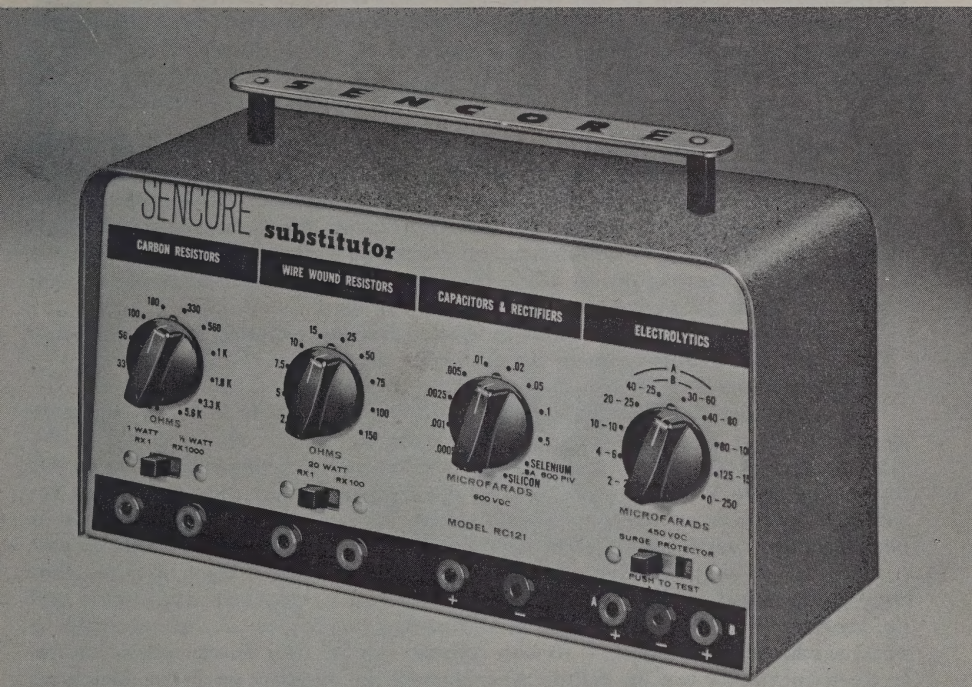
OPERATING INSTRUCTIONS

for the

RC121

Sencore Substitutor



SENCORE

The RC121 Sencore Substitutor offers a complete range of carbon resistors, wire wound resistors, 600 volt capacitors, electrolytic capacitors and rectifiers for quick on the spot substitution. This unit has an application as broad as electronics itself; engineers for experimental work, servicemen for parts substitution, amateurs for circuit checks or general trouble shooting, etc. Valuable time can be saved by everyone by having these complete ranges of parts at their finger tips. The Sencore Substitutor saves the normal soldering mess created when parts are wired in the circuit for test purposes only. Four test leads are provided with the Sencore Substitutor. If additional leads are required, any standard lead will fit. Each section of the RC121 Sencore Substitutor can be used independently. All sections can be used simultaneously. For example, a dual electrolytic, a power resistor and rectifier can all be substituted in a power supply section at the same time. Values selected to cover each range of resistance or capacitance are within 20 percent of each other. This is done so that values that fall in between can be substituted for with approximately 10 percent tolerance. This provides a value close enough for substitution or experimental work.

How to Use The Substitutor

Carbon Resistors:

The RC121 will substitute for 24 values of carbon resistors. The 12 lower values are 1 watt and the higher values are one-half watt. The values cover a range from 10 ohms to 5.6 megohms. To select a carbon resistor, proceed as follows:

1. Set the selector knob labeled CARBON RESISTORS to the value desired. If the value is above 5600 ohms, set the range slide switch to R X 1000 and multiply the readings by 1000. This selects a higher value bank of resistors. Standard 10 percent carbon resistors are used.
2. Insert the two red test leads in the red test jacks directly below and connect the alligator clips to the circuit for substitution.

Wire Wound Resistors:

20 Values of power resistors at 20 watts are available in twenty separate steps. The value covered range from 2.5 ohms to 15,000 ohms. 15,000 is the highest value power resistor commercially available, thus limiting the value to this figure. The Wire Wound resistor can be substituted in many places; for fuse resistors, in place of speakers for service work, etc. A practical application is to use the power resistors in place of tube in series filament sets if you desire to pull a tube for test purposes. Naturally, the other tubes will not light until the filament is connected. A close enough resistance value for practical application can be ascertained by multiplying the tube filament number by 2. For example, a 4EH7 would require an 8 ohm, 10 watt resistor. The 7.5 ohm power resistor on the Sencore Substitutor will do the job. The filament pin numbers on 7 pin miniatures are always 3 and 4 (except in portable radios); 4 and 5 on 9 pin miniature tubes and 2 and 7 or 7 and 8 on octal tubes, (except for rectifiers). These are just a few of the practical applications of the power resistor substitution portion.

Substitute power resistors as follows:

1. Select the value desired by setting the switch labeled WIRE WOUND RESISTORS to the nearest value. If the value desired is above 150 ohms, set the range slide switch to R X100 and multiply the reading by 100.
2. Insert two test leads into the red jacks directly below and connect the alligator clips to the circuit for substitution.

CAPACITORS AND RECTIFIERS

Ten capacitors from 100 mmfd, to .5 Mfd are provided. These capacitors are rated at 600 volts. One universal Selenium rectifier is provided. The rating on this rectifier is .5 Amps and 800 peak inverse volts. One universal silicon rectifier is provided which has the same rating as the selenium.

To substitute a capacitor:

Select the value by setting the knob under CAPACITORS AND RECTIFIERS to the exact value in microfards. Insert the test leads into the test jacks directly below. Polarity is not important on most capacitor substitutions. However, care should be taken on the .05 mfd, .1 mfd and .5 mfd capacitor as hum pick up may occur if the negative lead is not at the lowest potential in the circuit.

To substitute a rectifier:

Follow the same procedure as on capacitors except, be sure to observe polarity closely. It is always a good idea to place a small value of resistance in series with a rectifier when substituting in a circuit where a short may exist. This is especially true with the silicon rectifiers. Using the power resistor section of the Sencore Substitutor, start at 2500 ohms and reduce the value until you can determine that the rectifier will be safe.

ELECTROLYTIC CAPACITORS

Dual electrolytics, that can be substituted in any circuit operating from one volt to 450 volts DC, are provided. The range of capacity is from 2 Mfd. to 250 Mfd. The capacitors can be substituted as dual electrolytics as indicated on the panel, as single electrolytics, or can be paralleled to offer additional values that are the sum of the two.

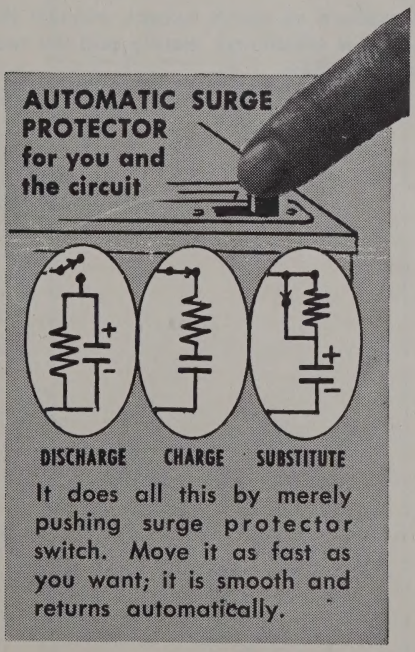


Figure 1. SURGE PROTECTOR

To substitute a single electrolytic:

Select the value that you desire to substitute from either the inner or outer range of electrolytics. Set the knob at this value. If you have selected the inner range, range B, insert test leads in the black jack and the red jack labeled B on the right. Connect the leads to the circuit for substitution being sure to observe polarity. Push the surge protector switch to the right. As the surge protector moves to the right, a resistor is placed in series with the electrolytic to prevent arc or accidental healing of a capacitor being bridged. When the switch is all the way to the right, the resistor is removed from the circuit and the capacitor connected directly. You can move the surge protector switch as rapidly as you choose. This is done automatically. If you desire to remove the surge protector from the circuit so that the electrolytic remains in the circuit for a long period of time, merely press the small button to the left of the switch and the switch will remain to the right. To release the surge protector switch, push the switch to the right and the spring loaded button will retract. DO NOT change electrolytic values when the surge protector is removed from the circuit. (pushed to the right). This can cause damage to the rotary switch. Be sure to release the surge protector switch first. When the surge protector switch is released the electrolytes in the Substitutor is automatically disconnected and discharged.

To Substitute a Dual Electrolytic.

Follow the same procedure except, plug a red test lead in each red jack. The black jack remains common to both capacitors. The surge protector protects both electrolytics in the same manner as it protects a single as described above.

To Parallel electrolytics:

Follow the same procedure as above except, connect the red test leads together. To determine the value substituted, merely add the two value indicated on range A and range B at that setting.

USING THE RC121 SENCORE SUBSTITUTOR AS A POWER SUPPLY

There are many additional uses that you can make from your Sencore Substitutor. Here is a simple power supply that can be used to power experimental circuits.

If the load is heavy, the 1000 ohm resistor can be reduced in value. If additional filtering is required, large electrolytic capacitors can be used.

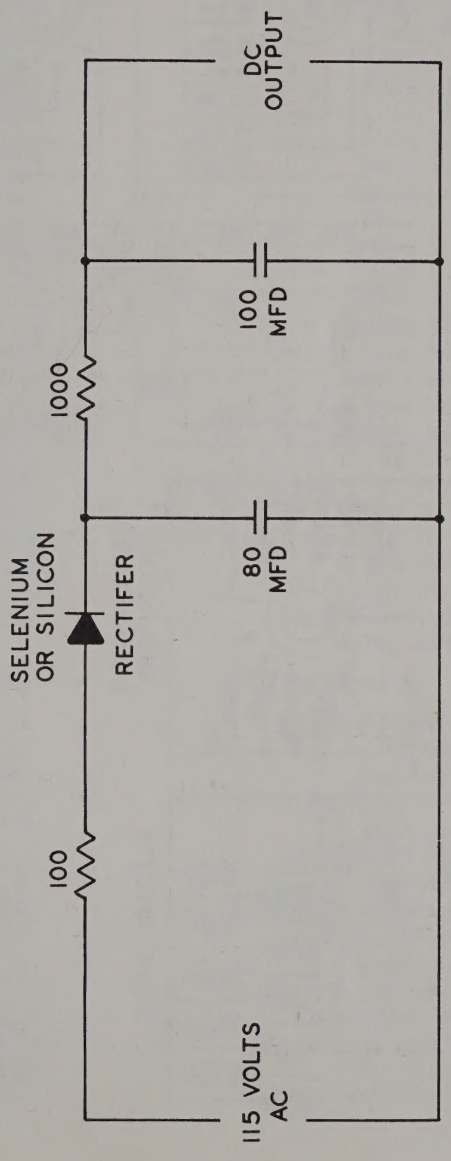
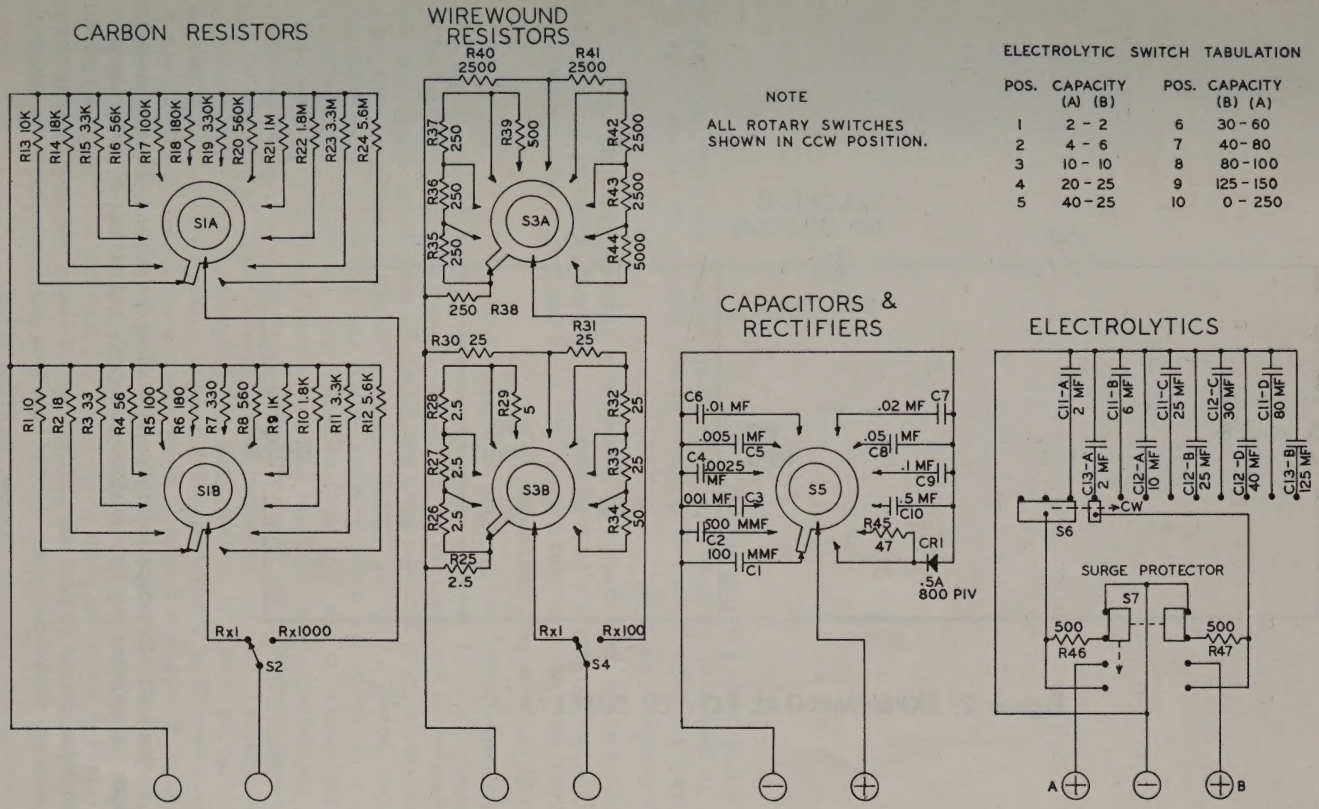


Figure 2. EXPERIMENTAL POWER SUPPLY.



NOTE

ALL ROTARY SWITCHES SHOWN IN CCW POSITION.

ELECTROLYTIC SWITCH TABULATION

POS.	CAPACITY (A) (B)	POS.	CAPACITY (B) (A)
1	2 - 2	6	30 - 60
2	4 - 6	7	40 - 80
3	10 - 10	8	80 - 100
4	20 - 25	9	125 - 150
5	40 - 25	10	0 - 250

RC121 SCHEMATIC

RC121 PARTS LIST

Reference #	Part #	Description	Price
R1	14G23	10Ω 1W 10%	$0.25
R2	14G24	18Ω 1W 10%	0.25
R3	14G25	33Ω 1W 10%	0.25
R4	14G26	56Ω 1W 10%	0.25
R5	14G27	100Ω 1W 10%	0.25
R6	14G28	180Ω 1W 10%	0.25
R7	14G29	330Ω 1W 10%	0.25
R8	14G30	560Ω 1W 10%	0.25
R9	14G60	1KΩ 1W 10%	0.25
R10	14G61	1.8KΩ 1W 10%	0.25
R11	14G62	3.3KΩ 1W 10%	0.25
R12	14G32	5.6KΩ 1W 10%	0.25
R13	14G34	10KΩ ½W 10%	0.25
R14	14G35	18KΩ ½W 10%	0.25
R15	14G36	33KΩ ½W 10%	0.25
R16	14G38	56KΩ ½W 10%	0.25
R17	14G39	100KΩ ½W 10%	0.25
R18	14G40	180KΩ ½W 10%	0.25
R19	14G20	330KΩ ½W 10%	0.25
R20	14G41	560KΩ ½W 10%	0.25
R21	14G59	1MΩ ½W 10%	0.25
R22	14G63	1.8MΩ ½W 10%	0.25
R23	14G64	3.3MΩ ½W 10%	0.25
R24	14G44	5.6MΩ ½W 10%	0.25
R25-R29	14S91	2.5, 5, 7.5, 10, 15 10W ±10%	$0.90
R30-R34	14S92	25, 50, 75, 100, 150Ω 10W ±10%	0.90
R35-R39	14S93	250, 500, 750, 1000, 1500Ω 10W ±10%	0.90
R40-R44	14S94	2.5K, 5K, 7.5K, 10K, 15KΩ 10W ±10%	0.90
R45	14G8	47Ω 5W ±10%	0.30
R46-R47	14G149	500Ω 5W ±10%	0.30
C1-C6	24S2	100, 500 MMF, .001 PEC .0025, .005, .01MF	0.75
C7	24G3	.02 MF 600V $^{+80}_{-20}$ Cap.	0.40
C8	24G4	.05 MF 600V Cap.	0.45
C9	24G5	.1 MF 600V Cap.	0.45
C10	24G6	.5 MF 600V Cap.	0.50
C11	24S44	80-25-6-2 MFD. 450V Electrolytic Cap.	2.75
C12	24S45	40-30-25-10 MFD. 450V Electrolytic Cap.	2.75
C13	24S46	125-2 MFD. 450V Electrolytic Cap.	2.75
S1	25G51	Rotory Sw. 2P12P	2.25
S2, S4	25G4	Slide Switch SPDT	0.40
S3	25G52	Rotary Switch 2P10P	2.25
S5	25G53	Rotary Switch 1P12P	1.75
S6	25G54	Rotary Switch 2P10P	1.75
S7	25G55	Slide Switch 2P3P	0.50
CR1	16G7	Rectifier-500MA 800PIV	1.80

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